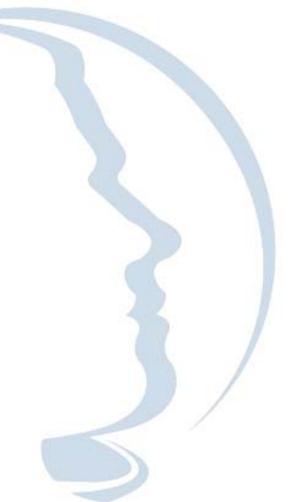
PERSONAL SPACEFLIGHT FEDERATION



Commercial Human Space Flight Industry Overview

Bretton Alexander, President

February 24, 2009

SUSTAIN Forum San Antonio, Texas



maintaining the data needed, and c including suggestions for reducing	lection of information is estimated to completing and reviewing the collect this burden, to Washington Headqu uld be aware that notwithstanding ar DMB control number.	ion of information. Send comments arters Services, Directorate for Information	regarding this burden estimate or mation Operations and Reports	or any other aspect of th , 1215 Jefferson Davis l	is collection of information, Highway, Suite 1204, Arlington	
1. REPORT DATE 2009		2. REPORT TYPE N/A		3. DATES COVERED		
4. TITLE AND SUBTITLE				5a. CONTRACT NUMBER		
Commercial Human Space Flight Industry Overview				5b. GRANT NUMBER		
				5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)				5d. PROJECT NUMBER		
				5e. TASK NUMBER		
				5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Personal Spaceflight Federation 1725 I St. NW, Suite 300 Washington, DC 20006				8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)		
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAII Approved for publ	LABILITY STATEMENT ic release, distributi	on unlimited				
13. SUPPLEMENTARY NO The original docum	otes nent contains color i	mages.				
14. ABSTRACT						
15. SUBJECT TERMS						
16. SECURITY CLASSIFIC	17. LIMITATION OF ABSTRACT	18. NUMBER	19a. NAME OF			
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	UU	OF PAGES 17	RESPONSIBLE PERSON	

Report Documentation Page

Form Approved OMB No. 0704-0188

Commercial Human Spaceflight

What is commercial human spaceflight?

- Systems designed for passengers
- Developed by the private sector
- Using predominantly private funds
- Serving multiple markets, including government needs

Two realms of activity

- Suborbital short flights above atmosphere, providing 3-5 minutes of weightlessness
 Adventure travel, scientific and industrial research, and astronaut training
- Orbital reaching orbit around Earth, providing hours or days of weightlessness
 Adventure travel, scientific and industrial research, manufacturing, Space Station servicing



The Personal Spaceflight Federation is the industry association of leading businesses and organizations working to make commercial human spaceflight a reality.

Our mission:

- Promote the development of commercial human spaceflight
- Pursue ever higher levels of safety
- Share best practices and expertise throughout the industry

About the PSF:

- Non-profit organization
- Based in Washington, DC
- CEO-level board of directors



Membership

Executive Members include developers and operators of:

- Spaceships
- Spaceports
- Orbital spaceflight facilities

Associate members include providers of training, medical, and life support products and services



Membership







































Industry Activities

Suborbital systems

- Building upon success of SpaceShipOne and the Ansari X PRIZE
- Systems under development
- Piloted flight testing to begin in next year or two
- First commercial passenger flights possible thereafter

Orbital systems

- Development of spaceships under way
 NASA Commercial Orbital Transportation Services (COTS) investments
- Orbital habitats under development
 Bigelow Aerospace testbeds in orbit, two demonstrators
- First commercial orbital passenger launches possible early next decade

Spaceports

- Commercial spaceports licensed in Mojave, California, Oklahoma and New Mexico
- State-sponsored spaceports under development in other states



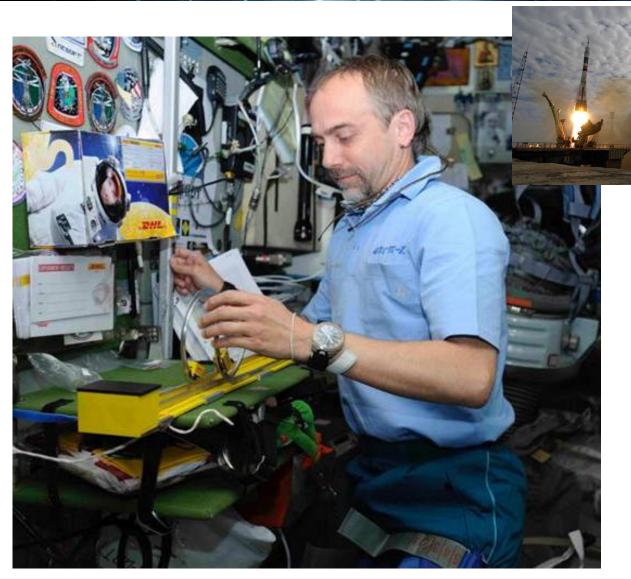
Armadillo Aerospace / X PRIZE Level I Lunar Lander Challenge



- Two 90-second hover flights to win Northrop Grumman Lunar Lander Challenge – Level I
- \$350,000 from NASA's Centennial Challenges program



Space Adventures Flight of Richard Garriott to ISS





Page 8

Virgin Galactic, Scaled Composites WhiteKnightTwo First Flight





SpaceX Falcon I Successful Flight to Orbit



- Liftoff from Omelek Island, September 28, 2008
- Achieved an elliptical orbit of 500 km by 700 km, 9.2 degrees inclination
- Successfully restarted second stage engine for circularization burn
- Also completed 9 engine MDC for Falcon 9



Widespread Industry Progress

XCOR Aerospace

First hotfire of Lynx engine

Spaceport America

Spaceport License

Orbital Outfitters

NASA Contract

SpaceDev

Merger with Sierra Nevada Corporation

Space Florida

Dedication of new launch complex

Additional progress by various companies



Other Markets Besides Space Tourism

NASA Human Space Flight

Science

Education / STEM

Military Space



NASA Human Spaceflight



- ISS resupply for both cargo and crew
- Increased access to ISS for science research
- Demonstrate technologies, increase TRLs
- Suborbital astronaut training



Science



PSF/NASA Ames Human-Tended Suborbital Science Workshop

American Geophysical Union Conference, San Francisco
December 2008

- New flight regimes for experiments
- Repeatability
- Fast call-up times
- Low-cost access



Education / STEM



- US needs to find ways to excite kids
- Inspire careers in science and engineering
- Paid for with corporate sponsorships, education grants



Military Space



- Experiments
- Pilot training
- Technology development for future systems
- Direct use of commercially developed systems



Contact information

Bretton Alexander

President
703-627-1692
brett@personalspaceflight.org

John Gedmark

Executive Director
202-349-1121
john@personalspaceflight.org

Personal Spaceflight Federation

www.personalspaceflight.org 1725 I St. NW, Suite 300 Washington, DC 20006

